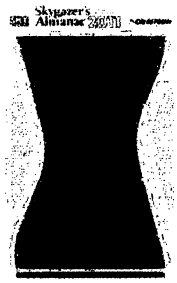
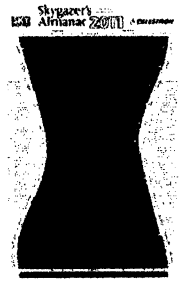


Learning to Use Your SkyGazer's Almanac



The SkyGazer's Almanac is a useful tool to help you find the location/ of planet's, the moon, meteor showers, and some of the brighter deep sky objects in the night sky for any given time of year.

Interpreting the Chart Based on Location

Your particular almanac is set up for 40° N latitude and 90° W longitude. Small adjustments need to be made to time interpretations on the chart if you do not live at this specific location.

1. Your location is:

   Latitude: 44.3°N Longitude: 96.8° W

2. For every degree west of 90° W longitude you need to add 4 minutes to your time reading from the chart.

   $6.8° \times \frac{4\,min}{1°} \approx 27\,min$

   You will add 27 minutes to each time reading from the chart because of your location. (clock time)

(NOTE: When asked to obtain times on your almanac, you need to note if it is LMT, which is read directly from the chart or your local clock time in Brookings.)

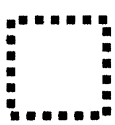
The chart is developed for 40° N latitude. Our latitude is close enough to this that no significant adjustments need to be made for most observations.

Overview of the Almanac

1. Why does the almanac have an hour-glass shape? (Hint: Note what months its thinner and what months its wider.)

   longer nighttime in winter, less in summer

Note the dates listed down the left side of the almanac and the time listed across the top. On the body of the almanac there are squares of dots.



2. a) Each vertical dot represents 1 day.

   b) Each horizontal dot represents 5 min.

3. a) How do you know the time of sunrise/sunset on the almanac?

   dark line inside of date numers

   b) What is the time of sunset tonight? 6:10pm LMT; 6:37pm local time for Sept. 14

   (depends on night selected)

* Note: Your Almanac is NOT set for Daylight Savings Time

(Sept. 14) c) At what time will twilight end tonight? ~7:40 pm LMT; 8:07 pm local time

(Sept. 15) d) What time is sunrise tomorrow morning? ~5:40 Am LMT; 6:07 Am local time

4. There are several objects listed on the almanac with the word "transits" attached. For example, "Saturn Transits". Where do we look in the sky for these objects? Why is this a desirable time to observe them? look on your meridian. Good time to look at them because they are highest in the sky.

Interpreting the Motions of Celestial Objects

You'll note several lines crossing the almanac. Each of these lines is labeled with what it represents. Use these lines to answer the following questions:

Set A - Reading the Time Scale

On the night of September 18th and early morning of September 19th,

(Technically, you should go back and adjust your local time answers for Daylight Savings Time.)

1. Saturn sets at 7:05 pm LMT; 7:32 pm local time.
2. the Moon rises at 9:20 pm LMT; 9:47 pm local time.
3. Neptune will be highest in the sky at 10:15 pm LMT; 10:42 pm local time.
   b) What term do we use for this location of an object in the sky? transit
4. Venus sets at 6:30 pm LMT; 6:57 pm local time.
5. Jupiter rises at ~7:52 pm LMT; 8:19 pm local time.
6. The star, Betelgeuse rises at 11:35 pm LMT; 12:02 Am (~ sept. 19) local time.
7. Uranus rises at ~6:15 pm LMT; 6:42 pm local time.
8. Deneb transits at ~8:50 pm LMT; 9:17 pm local time.
9. evening twilight ends at 7:35 pm LMT; 8:02 pm local time.

Set B - Reading the Date Scale

On what date(s)

1. does Jupiter reach its highest point in the sky at 10:15 pm LMT? ~Nov. 18
   b) What time will this be at your location? 10:42 pm

2. does Mars transit at 5:30 am LMT? Dec. 17

3. does the Orion Nebula reach its highest point in the sky at 1:00 am LMT? Nov. 30

   b) What time will this be at your location? 1:27 AM

4. in October will the moon set at 10:40 pm LMT? Nov. 1

5. will the sun rise at 6 am LMT? March 21 & Oct. 5

6. will the sun set at 7 pm LMT? May 5 & Aug. 14

Set C - Reading Time and Date Simultaneously

1. When will the Perseid meteor shower peak this year (see the month of August)?

   Date: ~Aug. 13 Time: 3:25 AM LMT; 3:52 AM local time

2. Venus conjuncts with what planet in September this year? Saturn (planet)

   Date: Sept. 29 Time: ~6:15 pm LMT; 6:42 pm local time

   b) What is meant by a planetary conjunction?
   Planets/objects appear close to each other in the sky.

3. When does Mercury reach greatest elongation in November?

   Date: Nov. 13 Time: ~5:45 pm LMT; 6:12 pm local time

   b) What is meant by "elongation"?
   Planet is at greatest angular distance from sun.

4. When will a full moon rise in December?

   Date: Dec 10 Time: 4:40 pm LMT; 5:07 pm local time

5. When is Jupiter at opposition this year?

   Date: Oct 28 Time: ~11:45 pm LMT; 12:02 AM Oct. 29 local time